

# Building Inspection Report



Brookfield, WI 53045

**Inspection Date:**

05/2018

**Prepared For:**

**Prepared By:**

Shamrock Building Inspection Consultants LLC

300 Cottonwood Ave. Suite 3

Hartland WI 53029

262-367-1536

**Report Number:**

**Inspector:**

Thomas Dempsey

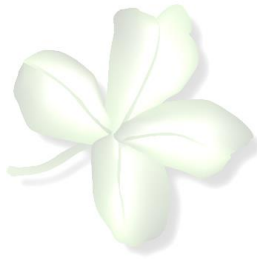
License #1055-106



# Table of Contents

---

<b>REPORT OVERVIEW</b>	<b>3</b>
<b>STRUCTURE</b>	<b>6</b>
<b>ROOFING</b>	<b>8</b>
<b>EXTERIOR</b>	<b>10</b>
<b>ELECTRICAL</b>	<b>12</b>
<b>HEATING</b>	<b>14</b>
<b>COOLING / HEAT PUMPS</b>	<b>15</b>
<b>INSULATION / VENTILATION</b>	<b>16</b>
<b>PLUMBING</b>	<b>17</b>
<b>INTERIOR</b>	<b>19</b>
<b>APPLIANCES</b>	<b>22</b>
<b>FIREPLACES / WOOD STOVES</b>	<b>23</b>
<b>PHOTO SUMMARY</b>	<b>24</b>
<b>MAINTENANCE ADVICE</b>	<b>28</b>
<b>INFORMATION ABOUT RADON</b>	<b>30</b>
<b>INFORMATION ABOUT CARBON MONOXIDE</b>	<b>32</b>



# Report Overview

## THE HOUSE IN PERSPECTIVE

---

This is a well-built home. As with all homes, ongoing maintenance is required and improvements to the systems of the home will be needed over time. ***The improvements that are recommended in this report are not considered unusual for a home of this age and location.*** Please remember that there is no such thing as a perfect home.

It is recommended that the buyer check with the City for remodeling permits. Permits follow the building, when you buy the building you are responsible for all permits past and present.

## CONVENTIONS USED IN THIS REPORT

---

For your convenience, the following conventions have been used in this report.

**Major Concern:** a system or component which is considered significantly deficient or is unsafe. Significant deficiencies need to be corrected and, except for some safety items, are likely to involve significant expense.

**Safety Issue:** denotes a condition that is unsafe and in need of prompt attention.

**Repair:** denotes a system or component which is missing or which needs corrective action to assure proper and reliable function.

**Improve:** denotes improvements which are recommended but not required.

**Monitor:** denotes a system or component needing further investigation and/or monitoring in order to determine if repairs are necessary.

**Deferred Cost:** denotes items that have reached or are reaching their normal life expectancy or show indications that they may require repair or replacement anytime during the next five (5) years.

Please note that those observations listed under “Discretionary Improvements” are not essential repairs, but represent logical long term improvements.

- For the purpose of this report, it is assumed that the house faces west.

## IMPROVEMENT RECOMMENDATION HIGHLIGHTS / SUMMARY

---

The following is a synopsis of the potentially significant improvements that should be budgeted for over the short term. Other significant improvements, outside the scope of this inspection, may also be necessary. Please refer to the body of this report for further details on these and other recommendations.

### MAJOR CONCERNS

#### SAFETY ISSUES

- **Safety Issue:** The garage door opener did not automatically reverse under resistance to closing. ***There is a serious risk of injury, particularly to children, under this condition.*** The opener is tested with a 2x4 lying flat on the floor per most manufacturer’s directions and the opener may need the down force adjusted or the unit may need replacement. Recommend a qualified trained professional for further review.

#### REPAIR ITEMS

- **Repair:** Nail heads are exposed at the shingles. These should be sealed to reduce the risk of leaks.
- **Repair:** The installation of the chimney flashing is incomplete and should be repaired to avoid leaks. Aluminum should not be used on chimney flashing because aluminum reacts with the lime in the mortar. The flashing should be galvanized steel embedded in the chimney and installed counter flashing to the roof line over step flashing. Have this evaluated by a tinsmith.
- **Repair:** The cap of the masonry chimney should be replaced with a proper cap that extends 1½ in. beyond the brick to protect the brick from water damage. The chimney flue should be checked for damage. Damaged flues can be unsafe.
- **Repair:** Downspout(s) that discharge onto the roof at the rear slope should be extended to discharge directly into the gutters below. This condition, if left unattended, can result in premature deterioration of the roofing under the end of the downspout.

- **Major Concern, Repair:** The wood siding should be painted at the rear wall to preserve the building.
- **Repair:** Localized evidence of rot was visible at the window sills and trim in various locations. Repairs should be undertaken when painting.
- **Major Concern, Repair:** The grading at the south side of the home should be improved to promote the flow of storm water away from the house. This can often be accomplished by the addition or re-grading of top soil. The ground should slope away from the house at a rate of one inch per foot for at least the first ten feet. At least eight (8) inches of clearance should be maintained between soil level and the bottom of exterior wall siding.
- **Major Concern, Repair:** The grading at the west side of the home should be improved to promote the flow of storm water away from the house. This can often be accomplished by the addition or re-grading of top soil. The ground should slope away from the house at a rate of one inch per foot for at least the first ten feet. At least eight (8) inches of clearance should be maintained between soil level and the bottom of exterior wall siding.
- **Repair:** The shower head in the main floor bathroom is in poor condition.
- **Repair:** The toilet tank is loose in the second floor bathroom. Recommend securing to the bowl and replace gasket as needed.
- **Repair:** The toilet is loose in the master bathroom. It should be reset with a new wax ring and properly secured to the floor.
- **Repair:** A ground fault circuit interrupter (GFCI) should be installed on the circuit for the whirlpool bathroom. A ground fault circuit interrupter offers protection from shock or electrocution.
- **Repair:** The radon mitigation system should have a sealed clear sump crock cover with a removable 4" port for testing the pump. Water levels inside the crock need to be monitored to ensure proper performance of the sump pump. If water levels raise above the drain tile the mitigation system will not function.
- **Repair:** The radon mitigation vent pipe that breaches the firewall in the garage must have a fire collar around the pipe. This is a potential fire hazard and must be addressed promptly.
- **Repair:** The wiring leading to the waste disposer appears to be defective. This should be improved as soon as possible.
- **Repair:** The fireplace chimney in the family room should be inspected and cleaned prior to operation. There is a crack in the lowest flue.
- **Repair:** Wiring in the basement should not touch hot air ductwork or hot water piping.
- **Safety Issue:** The ground fault circuit interrupter (GFCI) outlet in the master bathroom did not respond correctly to testing during the inspection. This receptacle should be replaced.
- **Repair:** Outlets in the floor are not protected outlets in the family room. They should be replaced with outlets are floor mounts.
- **Repair:** Wiring exposed on interior finishes in the basement should be relocated or protected by a rigid conduit.
- **Repair:** There is evidence of vermin activity in the main attic. A pest control specialist should be consulted in this regard.

## IMPROVEMENT ITEMS

### ITEMS TO MONITOR

- **Monitor:** The design of the roofing system is such that several vulnerable areas exist. There is a higher potential for leaks. Annual inspections to clean gutters and check flashings will be critical.

### DEFERRED COST ITEMS

- **Deferred Cost Item:** As is not uncommon for homes of this age and location, the air conditioning system is relatively old. It will require a higher level of maintenance, and may be more prone to major component breakdown. Predicting the frequency or time frame for repairs on any mechanical device is virtually impossible. If the compressor fails, or if breakdowns become chronic, replacing the entire system may be more cost-effective than continuing to undertake repairs.
- **Deferred Cost Item:** Water heaters have a typical life expectancy of 7 to 12 years. The existing unit is approaching this age range. One cannot predict with certainty when replacement will become necessary.
- **Monitor:** The sump pump is old. As with any old mechanical device, its useful remaining life is difficult to predict.

## **THE SCOPE OF THE INSPECTION**

---

All components designated for inspection in the ASHI® Standards of Practice are inspected, except as may be noted in the “Limitations of Inspection” sections within this report.

It is the goal of the inspection to put a home buyer in a better position to make a buying decision. Not all improvements will be identified during this inspection. Unexpected repairs should still be anticipated. The inspection should not be considered a guarantee or warranty of any kind.

This inspection is visual only. A representative sample of building components are viewed in areas that are accessible at the time of the inspection. No destructive testing or dismantling of building components is performed.

Please refer to the pre-inspection contract for a full explanation of the scope of the inspection.

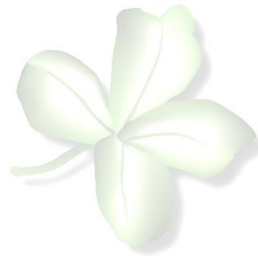
### **WEATHER CONDITIONS**

Dry weather conditions prevailed at the time of the inspection.

The estimated outside temperature was 60 degrees F.

### **RECENT WEATHER CONDITIONS**

Wet weather conditions have been experienced in the days leading up to the inspection.



# Structure

## DESCRIPTION OF STRUCTURE

<b>Foundation:</b>	•Poured Concrete •Basement Configuration •70% Of Foundation Was Not Visible•Steel
<b>Floor Structure:</b>	•Wood Joist
<b>Wall Structure:</b>	•Wood Frame, Brick Veneer •Not Visible
<b>Ceiling Structure:</b>	•Joist
<b>Roof Structure:</b>	•Trusses •Plywood Sheathing

## STRUCTURE OBSERVATIONS

### Positive Attributes

The construction of the home is good quality. The materials and workmanship, where visible, are good. The visible joist spans appear to be within typical construction practices. The inspection did not discover evidence of substantial structural movement.

### General Comments

No major defects were observed in the accessible structural components of the house. Typical minor flaws were detected in the structural components of the building.

### RECOMMENDATIONS / OBSERVATIONS

#### Foundation

- **Monitor:** Minor settlement cracks were observed in various locations in the foundation walls. This implies that some structural movement of the building has occurred. Cracks of this type should be watched for any sign of additional movement. In the absence of any sign of ongoing movement, repair should not be necessary.
- **Repair:** The cracks in the poured concrete foundation show water stains at the cracks that indicates water entry. These cracks should be sealed by a foundation repair company.

#### Floors

- **Monitor:** Minor unevenness was observed in the floor structure in various locations. This condition is common. It may be the result of the materials, framing design, installation methods and aging of the building. There was no evidence or need for immediate, costly repair.

#### Exterior Walls

- **Monitor:** Common minor cracks were observed on the exterior walls of the house in various locations. This implies that structural movement has occurred. The location, size, shape of these cracks is common. The inspection did not find evidence of significant movement requiring immediate major repairs.



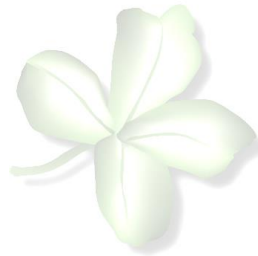
## **LIMITATIONS OF STRUCTURE INSPECTION**

---

As we have discussed and as described in your inspection contract, this is a visual inspection limited in scope by (but not restricted to) the following conditions:

- Structural components concealed behind finished surfaces could not be inspected.
- Only a representative sampling of visible structural components were inspected.
- Furniture and/or storage restricted access to some structural components.
- Engineering or architectural services such as calculation of structural capacities, adequacy, or integrity are not part of a home inspection.
- The roof space/attic was viewed from the access hatch only.
- There was no access to the side attic areas (behind the “knee wall”).
- Percent of foundation ceiling not visible was 70%

Please also refer to the pre-inspection contract for a detailed explanation of the scope of this inspection.



# Roofing

## DESCRIPTION OF ROOFING

<b>Roof Covering:</b>	•Asphalt Shingle
<b>Roof Flashings:</b>	•Metal
<b>Chimneys:</b>	•Masonry
<b>Roof Drainage System:</b>	•Galvanized Steel •Downspouts discharge below grade
<b>Method of Inspection:</b>	•Viewed from ladder at eave •Viewed with binoculars

## ROOFING OBSERVATIONS

### Positive Attributes

The roof coverings are newer and appear to be in generally good condition. The steep pitch of the roof should result in a longer than normal life expectancy for roof coverings. Roof flashing details appear to be in good order. The gutters are clean.

### General Comments

The design of the roofing system is such that several vulnerable areas exist. There is a higher potential for unanticipated repairs. Annual inspections and ongoing maintenance will be critical to the performance of the roofing system. The configuration of the roofing system is susceptible to ice damming and related leaks. The potential for ice dams varies with the severity of the winter and depending on insulation and ventilation under the roof. Severe ice dams can result in leaks, typically near the eaves. Solutions include better attic insulation and ventilation, eave protection below the roof coverings, or as a stop-gap measure, the installation of heating cables on the roof.

### RECOMMENDATIONS / OBSERVATIONS

#### Sloped Roofing

- **Monitor:** The design of the roofing system is such that several vulnerable areas exist. There is a higher potential for leaks. Annual inspections to clean gutters and check flashings will be critical.
- **Repair:** Nail heads are exposed at the shingles. These should be sealed to reduce the risk of leaks.

#### Flashings

- **Repair:** The installation of the chimney flashing is incomplete and should be repaired to avoid leaks. Aluminum should not be used on chimney flashing because aluminum reacts with the lime in the mortar. The flashing should be galvanized steel embedded in the chimney and installed counter flashing to the roof line over step flashing. Have this evaluated by a tinsmith.
- **Repair:** Nail heads are exposed at the flashing in various locations. They should be sealed to reduce risk of leaks.

#### Chimneys

- **Repair:** The cap of the masonry chimney should be replaced with a proper cap that extends 1½ in. beyond the brick to protect the brick from water damage. The chimney flue should be checked for damage. Damaged flues can be unsafe.





### Gutters & Downspouts

- **Monitor:** The downspouts that discharge below grade level on the entire house should be monitored. If they are ever suspected to be clogged or disconnected below grade, they should be redirected to discharge at least five (5) feet from the building. Foundation leakage adjacent to a downspout is an indication of a problem below grade.
- **Repair:** Downspout(s) that discharge onto the roof at the rear slope should be extended to discharge directly into the gutters below. This condition, if left unattended, can result in premature deterioration of the roofing under the end of the downspout.
- **Repair:** The installation of the kick out flashing is incomplete and should be repaired to avoid leaks. Kick out flashing should be installed to divert roof water into the gutter, and away from the roof wall joint.

### Discretionary Improvements

Covering the gutters with a protective mesh may help to avoid congestion with leaves and debris.



## LIMITATIONS OF ROOFING INSPECTION

As we have discussed and as described in your inspection contract, this is a visual inspection limited in scope by (but not restricted to) the following conditions:

- Not all of the underside of the roof sheathing is inspected for evidence of leaks.
- Evidence of prior leaks may be disguised by interior finishes.
- Estimates of remaining roof life are approximations only and do not preclude the possibility of leakage. Leakage can develop at any time and may depend on rain intensity, wind direction, ice buildup, and other factors.
- Antennae, chimney/flue interiors which are not readily accessible are not inspected and could require repair.
- Roof inspection may be limited by access, condition, weather, or other safety concerns.

Please also refer to the pre-inspection contract for a detailed explanation of the scope of this inspection.

# Exterior

## DESCRIPTION OF EXTERIOR

<b>Wall Covering:</b>	•Brick •Wood Siding
<b>Eaves, Soffits, And Fascias:</b>	•Wood
<b>Exterior Doors:</b>	•Solid Wood
<b>Window/Door Frames and Trim:</b>	•Wood
<b>Entry Driveways:</b>	•Asphalt
<b>Entry Walkways And Patios:</b>	•Pavers
<b>Porches, Decks, Steps, Railings:</b>	•Brick
<b>Overhead Garage Door(s):</b>	•Wood •Automatic Opener Installed
<b>Surface Drainage:</b>	•Level Grade

## EXTERIOR OBSERVATIONS

### Positive Attributes

The wood window frames are in generally good condition. There is no significant wood/soil contact around the perimeter of the house, thereby reducing the risk of insect infestation or rot. The driveway and walkways are in good condition.

### General Comments

The exterior of the home is generally in good condition. The exterior of the home shows normal wear and tear for a home of this age.

### RECOMMENDATIONS / OBSERVATIONS

**Monitor:** The homeowner is responsible for maintaining proper drainage around the building. This means keeping the gutters clean and properly pitched, downspouts extended 5-7 ft. from the building, underground downspouts clean and proper grading pitched away the foundation of the building approximately 1/2" per ft. for at least 10 ft. or to the lot line. Failure to do this maintenance can lead to water penetration, mold and eventual major foundation repair. **THIS CAN BE EXTREMELY EXPENSIVE.**

### Exterior Walls

- **Monitor:** Common minor cracks were observed on the exterior walls of the house in various locations. This implies that structural movement has occurred. The location, size, shape of these cracks is common. The inspection did not find evidence of significant movement requiring immediate major repairs.
- **Repair:** Weep holes (openings in the mortar joints, typically found at foundation level) in the brick veneer wall structure are missing. Weep holes allow moisture to weep to the exterior. Contact a masonry contractor.
- **Repair:** Utility penetrations need to be sealed and caulked throughout to prevent moisture and vermin entry. Steel wool and caulk work well to prevent mice from entering the building.
- **Major Concern, Repair:** The wood siding should be painted at the rear wall to preserve the building.

### Exterior Eaves

- **Repair:** The soffit vents are painted closed. This will reduce the attic ventilation significantly. These vents should be replaced to promote proper soffit ventilation.



**Windows**

- **Repair:** Localized evidence of rot was visible at the window sills and trim in various locations. Repairs should be undertaken when painting.

**Garage**

- **Safety Issue:** The garage door opener did not automatically reverse under resistance to closing. *There is a serious risk of injury, particularly to children, under this condition.* The opener is tested with a 2x4 lying flat on the floor per most manufacturer’s directions and the opener may need the down force adjusted or the unit may need replacement. Recommend a qualified trained professional for further review.
- **Repair:** The electric eyes on the garage door opener should be between 4” and 6” above the concrete floor.
- **Repair:** The overhead garage door shows evidence of localized rot and needs repairs.



**Lot Drainage**

- **Major Concern, Repair:** The grading at the south side of the home should be improved to promote the flow of storm water away from the house. This can often be accomplished by the addition or re-grading of top soil. The ground should slope away from the house at a rate of one inch per foot for at least the first ten feet. At least eight (8) inches of clearance should be maintained between soil level and the bottom of exterior wall siding.
- **Major Concern, Repair:** The grading at the west side of the home should be improved to promote the flow of storm water away from the house. This can often be accomplished by the addition or re-grading of top soil. The ground should slope away from the house at a rate of one inch per foot for at least the first ten feet. At least eight (8) inches of clearance should be maintained between soil level and the bottom of exterior wall siding.



**LIMITATIONS OF EXTERIOR INSPECTION**

As we have discussed and as described in your inspection contract, this is a visual inspection limited in scope by (but not restricted to) the following conditions:

- A representative sample of exterior components was inspected rather than every occurrence of components.
- The inspection does not include an assessment of geological, geotechnical, or hydrological conditions, or environmental hazards.
- Screening, shutters, awnings, or similar seasonal accessories, fences, recreational facilities, outbuildings, seawalls, break-walls, docks, erosion control and earth stabilization measures are not inspected unless specifically agreed-upon and documented in this report.
- Landscape components restricted a view of some exterior areas of the house.
- Storage in the garage restricted the inspection.
- Interior finishes and/or insulation restricted the inspection of the garage.
- Access below decks and/or porches was not possible.

Please also refer to the pre-inspection contract for a detailed explanation of the scope of this inspection.

# Electrical

## DESCRIPTION OF ELECTRICAL

<b>Size of Electrical Service:</b>	•120/240 Volt Main Service - Service Size: 200 Amps
<b>Service Drop:</b>	•Underground
<b>Service Entrance Conductors:</b>	•Aluminum
<b>Service Equipment &amp; Main Disconnects:</b>	•Main Service Rating 200 Amps •Breakers •Located: basement
<b>Service Grounding:</b>	•Copper •Water Pipe Connection •Ground Rod Connection •Ground Connection Not Visible
<b>Service Panel &amp; Overcurrent Protection:</b>	•Panel Rating: 200 Amp
<b>Sub-Panel(s):</b>	•None Visible
<b>Distribution Wiring:</b>	•Copper
<b>Wiring Method:</b>	• Non-Metallic Cable "Romex"
<b>Switches &amp; Receptacles:</b>	•Grounded
<b>Ground Fault Circuit Interrupters:</b>	•Bathroom(s) •Garage •Kitchen
<b>Smoke Detectors:</b>	•Present

## ELECTRICAL OBSERVATIONS

### Positive Attributes

The size of the electrical service is sufficient for typical single family needs. The electrical panel is well arranged and all fuses/breakers are properly sized. Generally speaking, the electrical system is in good order. All outlets and light fixtures that were tested operated satisfactorily. The distribution of electricity within the home is good. All 3-prong outlets that were tested were appropriately grounded. Ground fault circuit interrupter (GFCI) devices have been provided in some areas of the home. These devices are extremely valuable, as they offer an extra level of shock protection. Dedicated 220 volt circuits have been provided for all 220 volt appliances within the home.

### General Comments

Inspection of the electrical system revealed the need for typical, minor repairs. Although these are not costly to repair, they should be high priority for safety reasons. *Unsafe electrical conditions represent a shock hazard.* A licensed electrician should be consulted to undertake the repairs recommended below.

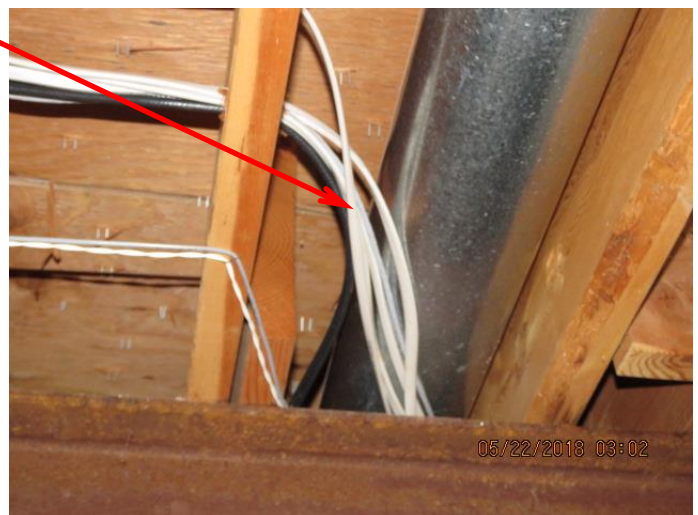
## RECOMMENDATIONS / OBSERVATIONS

### Distribution Wiring

- **Repair:** Wiring in the basement should not touch hot air ductwork or hot water piping.
- **Repair:** Wiring exposed on interior finishes in the basement should be relocated or protected by a rigid conduit.

### Outlets

- **Safety Issue:** The ground fault circuit interrupter (GFCI) outlet in the master bathroom did not respond correctly to testing during the inspection. This receptacle should be replaced.
- **Repair:** Outlets on the exterior of the home are not weather protected. All outlets and switches on the exterior of the building must be protected from the weather. These outlets and circuits should be investigated.



- **Repair:** Outlets in the floor are not protected outlets in the family room. They should be replaced with outlets are floor mounts.

#### Smoke Detectors

- **Repair:** The installation of smoke detectors in each bedroom and outside sleeping areas is recommended.
- **Repair:** Carbon monoxide meters are required on all floors including the basement, as of Feb. 2012.

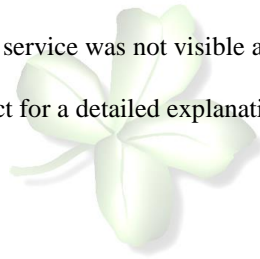


### LIMITATIONS OF ELECTRICAL INSPECTION

As we have discussed and as described in your inspection contract, this is a visual inspection limited in scope by (but not restricted to) the following conditions:

- Electrical components concealed behind finished surfaces are not inspected.
- Only a representative sampling of outlets and light fixtures were tested.
- Furniture and/or storage restricted access to some electrical components which may not be inspected.
- The inspection does not include remote control devices, alarm systems and components, low voltage wiring, systems, and components, ancillary wiring, systems, and other components which are not part of the primary electrical power distribution system.
- The ground connection for the electrical service was not visible at the time of the inspection.

Please also refer to the pre-inspection contract for a detailed explanation of the scope of this inspection.



# Heating

## DESCRIPTION OF HEATING

<b>Energy Source:</b>	•Gas
<b>Heating System Type:</b>	•Forced Air Furnace •Manufacturer: Carrier•Serial Number: 5113A 48670 120,000 Btu
<b>Vents, Flues, Chimneys:</b>	•Plastic
<b>Heat Distribution Methods:</b>	•Ductwork

## HEATING OBSERVATIONS

### Positive Attributes

Heating a home with this type of heating system should be relatively economical. Heat distribution within the home is adequate. The heating system is controlled by a “set back” thermostat. This type of thermostat, if set up correctly, helps reduce heating costs. The distribution of heat is divided into “zones,” allowing for greater ease of balancing heat flow.

### General Comments

The heating system shows no visible evidence of major defects.

## RECOMMENDATIONS / OBSERVATIONS

### Furnace

- The heating system was tested for CO with a Testo - 325 CO meter and the level was 13 ppm. For most furnaces and boilers 80 PPM or lower is considered normal operating condition. CO levels over 100 are a safety issue and should be evaluated by an HVAC contractor.
- The furnace was tested and functioned properly at the inspection. A temperature rise test was performed and the temperature rise was within the normal range. A temperature rise test is the temperature difference between the supply air and the return temp at the plenum.



## LIMITATIONS OF HEATING INSPECTION

As we have discussed and as described in your inspection contract, this is a visual inspection limited in scope by (but not restricted to) the following conditions:

- The adequacy of heat supply or distribution balance is not inspected.
- The interior of flues or chimneys which are not readily accessible are not inspected.
- The furnace heat exchanger, humidifier, or dehumidifier, and electronic air filters are not inspected.
- Solar space heating equipment/systems are not inspected.
- Although the heating system was operated, there are significant testing limitations at this time of year.
- Access to the furnace was somewhat restricted.

Please also refer to the pre-inspection contract for a detailed explanation of the scope of this inspection.

# Cooling / Heat Pumps

## DESCRIPTION OF COOLING / HEAT PUMPS

**Energy Source:** •Electricity •240 Volt Power Supply  
**Central System Type:** •Air Cooled Central Air Conditioning •Manufacturer: Carrier•Serial Number: 2694 E 01280 5 tons 50 amps

## COOLING / HEAT PUMPS OBSERVATIONS

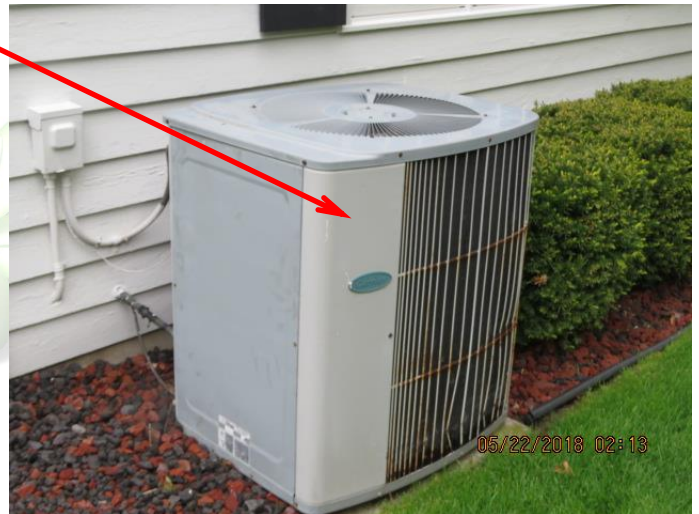
### General Comments

As the system is old, it will require repairs or replacement soon. **Major Concern: Monitor:** The coolant used in this AC unit is R-22. This coolant is no longer manufactured. You probably will be replacing this unit in the next 5 years.

### RECOMMENDATIONS / OBSERVATIONS

#### Central Air Conditioning

- **Deferred Cost Item:** As is not uncommon for homes of this age and location, the air conditioning system is relatively old. It will require a higher level of maintenance, and may be more prone to major component breakdown. Predicting the frequency or time frame for repairs on any mechanical device is virtually impossible. If the compressor fails, or if breakdowns become chronic, replacing the entire system may be more cost-effective than continuing to undertake repairs.
- **Repair:** Damaged and/or missing insulation on refrigerant lines should be repaired. These outside lines should be insulated all the way to the compressor unit to prevent loss of temperature in the lines.



## LIMITATIONS OF COOLING / HEAT PUMPS INSPECTION

As we have discussed and as described in your inspection contract, this is a visual inspection limited in scope by (but not restricted to) the following conditions:

- Window mounted air conditioning units are not inspected.
- The cooling supply adequacy or distribution balance are not inspected.
- **The air conditioning system could not be tested as the outdoor temperature was at or below 65 degrees F.**
- The system was not tested.
- Access to the air handler was somewhat restricted.

Please also refer to the pre-inspection contract for a detailed explanation of the scope of this inspection.

# Insulation / Ventilation

## DESCRIPTION OF INSULATION / VENTILATION

<b>Attic Insulation:</b>	•R 38 Fiberglass in Main Attic
<b>Exterior Wall Insulation:</b>	•Not Visible
<b>Basement Wall Insulation:</b>	•None Visible
<b>Vapor Retarders:</b>	•Unknown
<b>Roof Ventilation:</b>	•Roof Vents •Soffit Vents
<b>Exhaust Fan/vent Locations:</b>	•Bathroom •Kitchen •Dryer

## INSULATION / VENTILATION OBSERVATIONS

### Positive Attributes

Insulation levels are typical for a home of this age and construction.

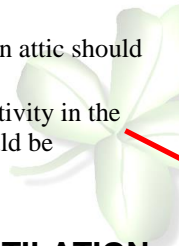
### General Comments

Caulking and weather-stripping around doors, windows and other exterior wall openings will help to maintain weather tightness and reduce energy costs. Despite the presence of insulation in the floor cavity, rooms above garages tend to be cooler during winter months.

## RECOMMENDATIONS / ENERGY SAVING SUGGESTIONS

### Attic / Roof

- **Repair:** Disturbed insulation in the main attic should be repaired or evened out.
- **Repair:** There is evidence of vermin activity in the main attic. A pest control specialist should be consulted in this regard.



## LIMITATIONS OF INSULATION / VENTILATION INSPECTION

As we have discussed and as described in your inspection contract, this is a visual inspection limited in scope by (but not restricted to) the following conditions:

- Insulation/ventilation type and levels in concealed areas are not inspected. Insulation and vapor barriers are not disturbed and no destructive tests (such as cutting openings in walls to look for insulation) are performed.
- Potentially hazardous materials such as Asbestos and Urea Formaldehyde Foam Insulation (UFFI) cannot be positively identified without a detailed inspection and laboratory analysis. This is beyond the scope of the inspection.
- An analysis of indoor air quality is not part of our inspection unless explicitly contracted-for and discussed in this or a separate report.
- Any estimates of insulation R values or depths are rough average values.
- The attic was viewed from the access hatch only.
- No access was gained to the roof cavity of the sloped ceilings.
- No access was gained to the wall cavities of the home.

Please also refer to the pre-inspection contract for a detailed explanation of the scope of this inspection.



# Plumbing

## DESCRIPTION OF PLUMBING

<b>Water Supply Source:</b>	•Public Water Supply
<b>Service Pipe to House:</b>	•Copper
<b>Main Water Valve Location:</b>	•Front Wall of Basement
<b>Interior Supply Piping:</b>	•Copper
<b>Waste System:</b>	•Public Sewer System (Reported By Real Estate Representative)
<b>Drain, Waste, &amp; Vent Piping:</b>	•Plastic
<b>Water Heater:</b>	•Gas •Approximate Capacity (in gallons): 75 •Manufacturer: Rheem•Serial Number: RHLNQ3812 04916
<b>Fuel Shut-Off Valves:</b>	•Natural Gas Main Valve At south side of home
<b>Other Components:</b>	•Sump Pump

## PLUMBING OBSERVATIONS

### Positive Attributes

The piping system within the home, for both supply and waste, is a good quality system. The water pressure supplied to the fixtures is reasonably good. A typical drop in flow was experienced when two fixtures were operated simultaneously. The plumbing fixtures appear to have been well-maintained.

### General Comments

The plumbing system requires some typical minor improvements.

### RECOMMENDATIONS / OBSERVATIONS

#### Water Heater

- **Improve:** It is recommended that when this water heater needs replacement a high efficient power vent water heater be installed. These water heaters are 30% more efficient than standard water heaters and there is less of a chance of CO poisoning.
- **Deferred Cost Item:** Water heaters have a typical life expectancy of 7 to 12 years. The existing unit is approaching this age range. One cannot predict with certainty when replacement will become necessary.

#### Supply Plumbing

- **Monitor:** Corrosion on the exterior of the supply piping was observed.

#### Fixtures

- **Repair:** The shower head in the main floor bathroom is in poor condition.
- **Repair:** The toilet tank is loose in the second floor bathroom. Recommend securing to the bowl and replace gasket as needed.
- **Repair:** The toilet is loose in the master bathroom. It should be reset with a new wax ring and properly secured to the floor.
- **Repair:** A ground fault circuit interrupter (GFCI) should be installed on the circuit for the whirlpool bathroom. A ground fault circuit interrupter offers protection from shock or electrocution.
- **Improve:** Access to the whirlpool motor should be provided without damaging the building structure or building finish as per NEC 680.73.



### Sump Pump

- **Monitor:** The sump pump is old. As with any old mechanical device, its useful remaining life is difficult to predict.
- **Monitor:** Sump pumps by their nature typically last for 1 to 5 years. They should be tested twice a year by pouring a bucket of water into the crock to make sure that the pump functions properly. A nonfunctioning or damaged sump pump can cause the basement to flood.
- **Repair:** The radon mitigation system should have a sealed clear sump crock cover with a removable 4" port for testing the pump. Water levels inside the crock need to be monitored to ensure proper performance of the sump pump. If water levels raise above the drain tile the mitigation system will not function.
- **Repair:** The radon mitigation vent pipe that breaches the firewall in the garage must have a fire collar around the pipe. This is a potential fire hazard and must be addressed promptly.



### LIMITATIONS OF PLUMBING INSPECTION

As we have discussed and as described in your inspection contract, this is a visual inspection limited in scope by (but not restricted to) the following conditions:

- Portions of the plumbing system concealed by finishes and/or storage (below sinks, etc.), below the structure, or beneath the ground surface are not inspected.
- Water quantity and water quality are not tested unless explicitly contracted-for and discussed in this or a separate report.
- Clothes washing machine connections are not inspected.
- Interiors of flues or chimneys which are not readily accessible are not inspected.
- Water conditioning systems, solar water heaters, fire and lawn sprinkler systems, and private waste disposal systems are not inspected unless explicitly contracted-for and discussed in this or a separate report.
- An inspection of the sewage system is outside the scope of this inspection.
- An inspection of the well is outside the scope of this inspection. A sample of the well water can be sent to a lab at an additional expense.
- The discharge location of the sump pump was not verified.
- An inspection of the lawn sprinkler system is outside the scope of this inspection.
- The water conditioning system was not part of the inspection.
- Hose bibs that were shut off were not tested.
- Due to the sealed sump crock cover, the sump pump was not tested.



Please also refer to the pre-inspection contract for a detailed explanation of the scope of this inspection.

# Interior

## DESCRIPTION OF INTERIOR

<b>Wall And Ceiling Materials:</b>	•Drywall
<b>Floor Surfaces:</b>	•Carpet •Tile •Wood •Concrete
<b>Window Type(s) &amp; Glazing:</b>	•Casement •Double/Single Hung •Fixed Pane •Double Glazed •Single Pane with Storm Window
<b>Doors:</b>	•Wood-Solid Core •Storm Door(s)

## INTERIOR OBSERVATIONS

### General Condition of Interior Finishes

On the whole, the interior finishes of the home are in above average condition. Typical minor flaws were observed in some areas.

### General Condition of Windows and Doors

The windows have, for the most part, been well-maintained.

### General Condition of Floors

The flooring system shows evidence of typical minor sags and unevenness.

## RECOMMENDATIONS / OBSERVATIONS

### Wall / Ceiling Finishes

- **Monitor:** Evidence of patching was detected in the master bathroom.
- **Monitor:** Minor cracks were noted in various locations.
- **Monitor:** Typical drywall flaws were observed in various locations.

### Floors

- **Monitor:** Sagging floors are apparent in various locations.

### Windows

- **Monitor:** Thermal pane windows were observed on this property. Due to the weather, light conditions and window treatments fogging glass seals were not visible. Just because the windows are not fogging does not mean that the window seals are not bad.

### Doors

- **Repair:** Doors in various locations should be trimmed or adjusted as necessary to work properly.

### Basement Leakage

- **Monitor:** The basement shows evidence of moisture penetration. *It should be understood that it is impossible to predict the severity or frequency of moisture penetration on a one-time visit to a home.* Virtually all basements exhibit signs of moisture penetration and virtually all basements will indeed leak at some point in time. The visible evidence is not unusual for a home of this age, construction and location. Further monitoring of the foundation will be required to determine what improvements, if any, will be required. Basement leakage rarely affects the structural integrity of a home.

The vast majority of basement leakage problems are the result of insufficient control of storm water at the surface. The ground around the house should be sloped to encourage water to flow away from the foundations. Gutters and downspouts should act to collect roof water and drain the water at least five (5) feet from the foundation or into a functional storm sewer. Downspouts that are clogged or broken below grade level, or that discharge too close to the



foundation are the most common source of basement leakage. Please refer to the Roofing and Exterior sections of the report for more information.

In the event that basement leakage problems are experienced, lot and roof drainage improvements should be undertaken as a first step. Please beware of contractors who recommend expensive solutions. Excavation, damp-proofing and/or the installation of drainage tiles should be a last resort. In some cases, however, it is necessary. Your plans for using the basement may also influence the approach taken to curing any dampness that is experienced.

- **Monitor:** It is very common for shrinkage and/or settling cracks to develop in foundation walls. It is also common for these cracks to leak. If leakage is experienced, improve lot drainage adjacent to the crack. If leakage persists, various methods of crack repair are available. These include interior patching with an epoxy resin or hydraulic cement and exterior repairs after excavation. The exterior repair, although more expensive, is more often successful in eliminating leakage.
- **Monitor:** Basement leakage problems can sometimes develop as a result of damaged, congested or ineffective perimeter foundation drainage tiles (often referred to as “weeping tiles”). It is impossible to predict the condition of drainage tiles during a visual inspection of the basement.
- **Monitor:** Depending on the location of the house, ground water tables can sometimes influence basement leakage. Ground water levels tend to fluctuate seasonally and during heavy rainfall. It is impossible to predict what influence ground water may have, during a one-time inspection of a home. If ground water levels extend above the height of the basement floor, the performance of the perimeter foundation drainage tile is very important. If ground water fluctuation causes basement leakage, the installation of effective drainage tiles (and sump pumps, in some cases) becomes necessary.
- **Monitor:** The amount of water staining around the cracks in the basement floor indicate that the drain tile system may not be working and/or designed adequately. It is recommended that a licensed drain tile specialist be consulted in regards to what measures, if any, need to be taken.

### Environmental Issues

- **Monitor:** There is the potential for lead content in the drinking water within the home. Lead in water may have two sources; the piping system of the utility delivering water to the house and/or the solder used on copper pipes prior to 1988. This can only be confirmed by laboratory analysis. An evaluation of lead in water is beyond the scope of this inspection. For more information, consult the Environmental Protection Agency (E.P.A.) for further guidance and a list of testing labs in your area.
- **Monitor:** Radon gas is a naturally occurring gas that is invisible, odorless and tasteless. A danger exists when the gas percolates through the ground and enters a tightly enclosed structure (such as a home). Long term exposure to high levels of radon gas can cause cancer. *The Environmental Protection Agency (E.P.A.) states that a radon reading of more than 4.0 picocuries per liter of air represents a health hazard.* A radon evaluation is beyond the scope of this inspection (unless specifically requested). For more information, consult the Environmental Protection Agency (E.P.A.) for further guidance and a list of testing labs in your area.
- **Monitor:** It would be wise to install carbon monoxide detectors within the home. Carbon monoxide is a colorless, odorless gas that can result from a faulty fuel burning furnace, range, water heater, space heater or wood stove. Proper maintenance of these appliances is the best way to reduce the risk of carbon monoxide poisoning. For more information, consult the Consumer Product Safety Commission at 1-800-638-2772 (C.P.S.C.).



### Discretionary Improvements

In addition to protecting bedrooms, additional smoke detectors are recommended outside sleeping areas within the home.

Install new exterior lock sets upon taking possession of the home.

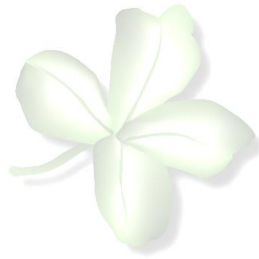
## LIMITATIONS OF INTERIOR INSPECTION

---

As we have discussed and as described in your inspection contract, this is a visual inspection limited in scope by (but not restricted to) the following conditions

- Furniture, storage, appliances and/or wall hangings are not moved to permit inspection and may block defects.
- Carpeting, window treatments, central vacuum systems, household appliances, recreational facilities, paint, wallpaper, and other finish treatments are not inspected.
- Recent renovations and/or interior painting concealed historical evidence.
- Portions of the foundation walls were concealed from view.
- The adequacy of the fireplace draw cannot be determined during a visual inspection.
- Underlying components were not visible i.e.-Sheathing, Studs, Wall Cavities, Insulation, MOLD

Please also refer to the pre-inspection contract for a detailed explanation of the scope of this inspection.



# Appliances

## DESCRIPTION OF APPLIANCES

**Appliances Tested:**

**Laundry Facility:**

- Dishwasher •Waste Disposer
- 240 Volt Circuit for Dryer •Dryer Vented to Building Exterior •120 Volt Circuit for Washer •Hot and Cold Water Supply for Washer •Washer Discharges to Laundry Tub/Sink

**Other Components Tested:**

- Kitchen Exhaust Hood

## APPLIANCES OBSERVATIONS

**Positive Attributes**

All appliances that were tested responded satisfactorily. The kitchen and laundry facilities are well organized.

**General Comments**

Only minor improvements to the appliances are needed.

**RECOMMENDATIONS / OBSERVATIONS**

**NOTE: FIRE HAZARD... DRYER LINT**

I recommend that the entire clothes dryer venting system be cleaned of the accumulated lint on a regular basis. Dryer vent lint build-up is known to be a FIRE HAZARD. Replacing the flexible venting is recommended, as cleaning this is virtually impossible. Use only properly sized and installed metal venting material as the commonly installed plastic venting materials are not fire proof.

**Waste Disposer**

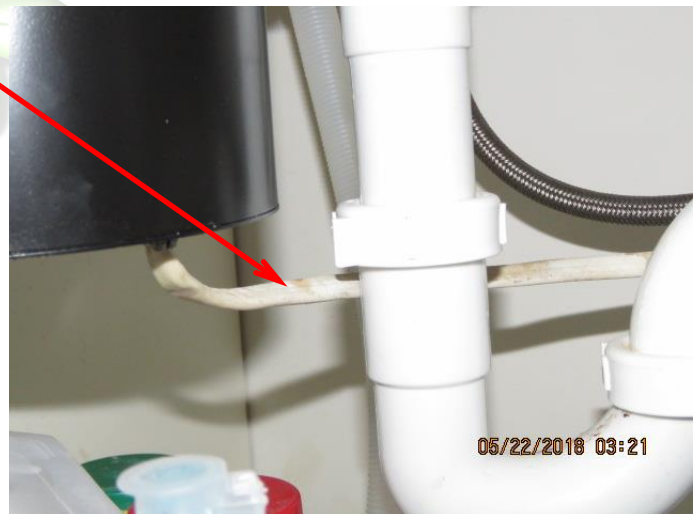
- **Repair:** The wiring leading to the waste disposer appears to be defective. This should be improved as soon as possible.

## LIMITATIONS OF APPLIANCES INSPECTION

As we have discussed and as described in your inspection contract, this is a visual inspection limited in scope by (but not restricted to) the following conditions

- Thermostats, timers and other specialized features and controls are not tested.
- The temperature calibration, functionality of timers, effectiveness, efficiency and overall performance of appliances is outside the scope of this inspection.

Please also refer to the pre-inspection contract for a detailed explanation of the scope of this inspection.



# Fireplaces / Wood Stoves

## DESCRIPTION OF FIREPLACES / WOOD STOVES

- Fireplaces:** •Masonry Firebox  
**Vents, Flues, Chimneys:** •Outside Combustion Air Not Provided •Masonry Chimney-Lined

## FIREPLACES / WOOD STOVES OBSERVATIONS

### General Comments

On the whole, the fireplace and its components are in average condition. Typical minor flaws were observed in some areas.

### RECOMMENDATIONS / OBSERVATIONS

#### Fireplaces

- **Repair:** The fireplace chimney in the family room should be inspected and cleaned prior to operation. There is a crack in the lowest flue.



## LIMITATIONS OF FIREPLACES / WOOD STOVES INSPECTION

As we have discussed and as described in your inspection contract, this is a visual inspection limited in scope by (but not restricted to) the following conditions

- The interiors of flues or chimneys are not inspected.
- Firescreens, fireplace doors, appliance gaskets and seals, automatic fuel feed devices, mantles and fireplace surrounds, combustion make-up air devices, and heat distribution assists (gravity or fan-assisted) are not inspected.
- The inspection does not involve igniting or extinguishing fires nor the determination of draft.
- Fireplace inserts, stoves, or firebox contents are not moved.
- The adequacy of the fireplace draw is not determined during a visual inspection; for safety reasons, if no fire is burning we do not ignite fires nor light paper or other materials.

### Other Fireplace/Stove Components Not Inspected:

- Interiors of flues or chimneys
- Mantles and fireplace surrounds

Please also refer to the pre-inspection contract for a detailed explanation of the scope of this inspection.

# Photo Summary



Leak at sprinkler



Spalling brick on chimney





Storm doors need paint



Wiring separated from junction box



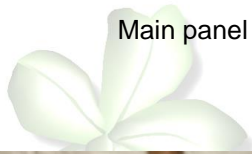
Exposed nonmetallic wiring



Attic



Main panel



Water main

# Maintenance Advice

## UPON TAKING OWNERSHIP

---

After taking possession of a new home, there are some maintenance and safety issues that should be addressed immediately. The following checklist should help you undertake these improvements:

- Change the locks on all exterior entrances, for improved security.
- Check that all windows and doors are secure. Improve window hardware as necessary. Security rods can be added to sliding windows and doors. Consideration could also be given to a security system.
- Install smoke detectors on each level of the home. Ensure that there is a smoke detector outside all sleeping areas. Replace batteries on any existing smoke detectors and test them. Make a note to replace batteries again in one year.
- Create a plan of action in the event of a fire in your home. Ensure that there is an operable window or door in every room of the house. Consult with your local fire department regarding fire safety issues and what to do in the event of fire.
- Examine driveways and walkways for trip hazards. Undertake repairs where necessary.
- Examine the interior of the home for trip hazards. Loose or torn carpeting and flooring should be repaired.
- Undertake improvements to all stairways, decks, porches and landings where there is a risk of falling or stumbling.
- Review your home inspection report for any items that require immediate improvement or further investigation. Address these areas as required.
- Install rain caps and vermin screens on all chimney flues, as necessary.
- Investigate the location of the main shut-offs for the plumbing, heating and electrical systems. If you attended the home inspection, these items would have been pointed out to you.

## REGULAR MAINTENANCE

---

### EVERY MONTH

- Check that fire extinguisher(s) are fully charged. Re-charge if necessary.
- Examine heating/cooling air filters and replace or clean as necessary.
- Inspect and clean humidifiers and electronic air cleaners.
- If the house has hot water heating, bleed radiator valves.
- Clean gutters and downspouts. Ensure that downspouts are secure, and that the discharge of the downspouts is appropriate. Remove debris from window wells.
- Carefully inspect the condition of shower enclosures. Repair or replace deteriorated grout and caulk. Ensure that water is not escaping the enclosure during showering. Check below all plumbing fixtures for evidence of leakage.
- Repair or replace leaking faucets or shower heads.
- Secure loose toilets, or repair flush mechanisms that become troublesome.

### SPRING AND FALL

- Examine the roof for evidence of damage to roof coverings, flashings and chimneys.
- Look in the attic (if accessible) to ensure that roof vents are not obstructed. Check for evidence of leakage, condensation or vermin activity. Level out insulation if needed.
- Trim back tree branches and shrubs to ensure that they are not in contact with the house.
- Inspect the exterior walls and foundation for evidence of damage, cracking or movement. Watch for bird nests or other vermin or insect activity.
- Survey the basement and/or crawl space walls for evidence of moisture seepage.
- Look at overhead wires coming to the house. They should be secure and clear of trees or other obstructions.

- Ensure that the grade of the land around the house encourages water to flow away from the foundation.
- Inspect all driveways, walkways, decks, porches, and landscape components for evidence of deterioration, movement or safety hazards.
- Clean windows and test their operation. Improve caulking and weather-stripping as necessary. Watch for evidence of rot in wood window frames. Paint and repair window sills and frames as necessary.
- Test all ground fault circuit interrupter (GFCI) devices, as identified in the inspection report.
- Shut off isolating valves for exterior hose bibs in the fall, if below freezing temperatures are anticipated.
- Test the Temperature and Pressure Relief (TPR) Valve on water heaters.
- Inspect for evidence of wood boring insect activity. Eliminate any wood/soil contact around the perimeter of the home.
- Test the overhead garage door opener, to ensure that the auto-reverse mechanism is responding properly. Clean and lubricate hinges, rollers and tracks on overhead doors.
- Replace or clean exhaust hood filters.
- Clean, inspect and/or service all appliances as per the manufacturer's recommendations.

### **ANNUALLY**

- Replace smoke detector batteries.
- Have the heating, cooling and water heater systems cleaned and serviced.
- Have chimneys inspected and cleaned. Ensure that rain caps and vermin screens are secure.
- Examine the electrical panels, wiring and electrical components for evidence of overheating. Ensure that all components are secure. Flip the breakers on and off to ensure that they are not sticky.
- If the house utilizes a well, check and service the pump and holding tank. Have the water quality tested. If the property has a septic system, have the tank inspected (and pumped as needed).
- If your home is in an area prone to wood destroying insects (termites, carpenter ants, etc.), have the home inspected by a licensed specialist. Preventative treatments may be recommended in some cases.

### **PREVENTION IS THE BEST APPROACH**

---

Although we've heard it many times, nothing could be more true than the old cliché "an ounce of prevention is worth a pound of cure." Preventative maintenance is the best way to keep your house in great shape. It also reduces the risk of unexpected repairs and improves the odds of selling your house at fair market value, when the time comes.

Please feel free to contact our office should you have any questions regarding the operation or maintenance of your home. Enjoy your home!

# Information about Radon



## EPA RADON RISK INFORMATION

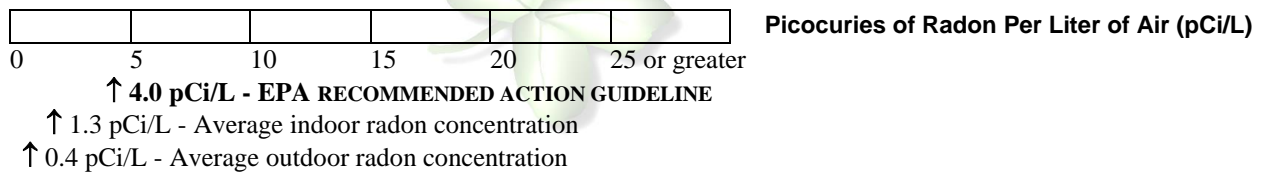
Fifty-five percent of our exposure to natural sources of radiation usually comes from radon. Radon is a colorless, tasteless, and odorless gas that comes from the decay of uranium found in nearly all soils. Levels of radon vary throughout the country. Radon is found all over the United States and scientists estimate that nearly one out of every 15 homes in this country has radon levels above recommended action levels.

Radon usually moves from the ground up and migrates into homes and other buildings through cracks and other holes in their foundations. The buildings trap radon inside, where it accumulates and may become a health hazard if the building is not properly ventilated.

When you breathe air containing a large amount of radon, the radiation can damage your lungs and eventually cause lung cancer. Scientists believe that radon is the second leading cause of lung cancer in the United States. It is estimated that 7,000 to 30,000 Americans die each year from radon-induced lung cancer. Only smoking causes more lung cancer deaths and smokers exposed to radon are at higher risk than nonsmokers. Testing your home is the only way to know if you and your family are at risk from radon.

### Testing for Radon.

Should you have your home tested, use the chart below to compare your radon test results with the EPA guideline. The higher a home's radon level, the greater the health risk to you and your family.



**The U.S. Environmental Protection Agency (EPA) and the Surgeon General strongly recommend taking further action when the home's radon test results are 4.0 pCi/L or greater.** The concentration of radon in the home is measured in picocuries per liter of air (pCi/L). Radon levels less than 4.0 pCi/L still pose some risk and in many cases may be reduced. If the radon level in your home is between 2.0 and 4.0 pCi/L, EPA recommends that you **consider** fixing your home. The national average indoor radon level is about 1.3 pCi/L. The higher a home's radon level, the greater the health risk to you and your family. Smokers and former smokers are at especially high risk. There are straightforward ways to fix a home's radon problem that are not too costly. Even homes with very high levels can be reduced to below 4.0 pCi/L. EPA recommends that you use an EPA or State-approved contractor trained to fix radon problems.

### What do radon test results mean?

If your radon level is **below 4 pCi/L**, you do not need to take action.

If your radon level is **4 pCi/L or greater**, use the following charts to determine what your test results mean. Depending upon the type of test(s) you took, you will have to either test again or fix the home.

NOTE: All tests should meet EPA technical protocols.

**Chart 1: Radon Test Conducted Outside Real Estate Transaction**

Type of Test(s)	If Radon Level Is 4.0 pCi/L or Greater
Single Short-Term Test	<b>Test Again*</b>
Average of Short-Term Tests	<b>Fix The Home</b>
One Long-Term Test	<b>Fix The Home</b>

\* If your first short term test is several times greater than 4.0 pCi/L - for example, about 10.0 pCi/L or higher - you should take a second short-term test immediately.

**Chart 1: Radon Test Conducted During a Real Estate Transaction (Buying or Selling a Home)**

Type of Test(s)	If Radon Level Is 4.0 pCi/L or Greater
Single Active Short-Term Test (this test requires a machine)	<b>Fix The Home</b>
Average of 2 Passive Short-Term Tests* (these tests do not require machines)	<b>Fix The Home</b>
One Long-Term Test	<b>Fix The Home</b>

\* Use two passive short-term tests and average the results.

---

**What should I do after testing?**

If your radon level is 4.0 pCi/L or greater, you can call your State radon office to obtain more information, including a list of EPA or State-approved radon contractors who can fix or can help you develop a plan for fixing the radon problem. Reduction methods can be as simple as sealing cracks in floors and walls or as complex as installing systems that use pipes and fans to draw radon out of the building.

EPA has a National Radon Program to inform the public about radon risks, train radon mitigation contractors, provide grants for state radon programs, and develop standards for radon-resistant buildings. EPA works with health organizations, state radon programs, and other federal agencies to make the program as effective as possible.

**For more information about radon, its risks and what you can do to protect yourself, call 1-800-SOS-RADON and request a free copy of EPA's *A Citizen's Guide to Radon*. You may also call the Radon Fix-It Line at 1-800-644-6999 between noon and 8pm Monday through Friday, EST/EDT, for information and assistance. This toll-free line is operated by Consumer Federation of America, a nonprofit consumer organization.**

# Information about Carbon Monoxide

---

## What is carbon monoxide (CO) and how is it produced in the home?

CO is a colorless, odorless, toxic gas. It is produced by the incomplete combustion of solid, liquid and gaseous fuels. Appliances fueled with gas, oil, kerosene, or wood may produce CO. If such appliances are not installed, maintained, and used properly, CO may accumulate to dangerous levels.

### What are the symptoms of CO poisoning and why are these symptoms particularly dangerous?

Breathing CO causes symptoms such as headaches, dizziness, and weakness in healthy people. CO also causes sleepiness, nausea, vomiting, confusion and disorientation. At very high levels, it causes loss of consciousness and death.

This is particularly dangerous because CO effects often are not recognized. CO is odorless and some of the symptoms of CO poisoning are similar to the flu or other common illnesses.

### Are some people more affected by exposure to CO than others?

CO exposures especially affect unborn babies, infants, and people with anemia or a history of heart disease. Breathing low levels of the chemical can cause fatigue and increase chest pain in people with chronic heart disease.

### How many people die from CO poisoning each year?

In 1989, the most recent year for which statistics are available, there were about 220 deaths from CO poisoning associated with gas-fired appliances, about 30 CO deaths associated with solid-fueled appliances (including charcoal grills), and about 45 CO deaths associated with liquid-fueled heaters.

### How many people are poisoned from CO each year?

Nearly 5,000 people in the United States are treated in hospital emergency rooms for CO poisoning; this number is believed to be an underestimate because many people with CO symptoms mistake the symptoms for the flu or are misdiagnosed and never get treated.

---

## How can production of dangerous levels of CO be prevented?

Dangerous levels of CO can be prevented by proper appliance maintenance, installation, and use:

### Maintenance:

- A qualified service technician should check your home's central and room heating appliances (including water heaters and gas dryers) annually. The technician should look at the electrical and mechanical components of appliances, such as thermostat controls and automatic safety devices.
- Chimneys and flues should be checked for blockages, corrosion, and loose connections.
- Individual appliances should be serviced regularly. Kerosene and gas space heaters (vented and unvented) should be cleaned and inspected to insure proper operation.
- CPSC recommends finding a reputable service company in the phone book or asking your utility company to suggest a qualified service technician.

### Installation:

- Proper installation is critical to the safe operation of combustion appliances. All new appliances have installation instructions that should be followed exactly. Local building codes should be followed as well.
- Vented appliances should be vented properly, according to manufacturer's instructions.
- Adequate combustion air should be provided to assure complete combustion.
- All combustion appliances should be installed by professionals.

### Appliance Use:

Follow manufacturer's directions for safe operation.

- Make sure the room where an unvented gas or kerosene space heater is used is well ventilated; doors leading to another room should be open to insure proper ventilation.
- Never use an unvented combustion heater overnight or in a room where you are sleeping.

### Are there signs that might indicate improper appliance operation?



Yes, these are:

- Decreasing hot water supply
- Furnace unable to heat house or runs constantly
- Sooting, especially on appliances
- Unfamiliar or burning odor
- Increased condensation inside windows

**Are there visible signs that might indicate a CO problem?**

Yes, these are:

- Improper connections on vents and chimneys
- Visible rust or stains on vents and chimneys
- An appliance that makes unusual sounds or emits an unusual smell
- An appliance that keeps shutting off (Many new appliances have safety components attached that prevent operation if an unsafe condition exists. If an appliance stops operating, it may be because a safety device is preventing a dangerous condition. Therefore, don't try to operate an appliance that keeps shutting off; call a service person instead.)

**Are there other ways to prevent CO poisoning?**

Yes, these are:

- Never use a range or oven to heat the living areas of the home
- Never use a charcoal grill or hibachi in the home
- Never keep a car running in an attached garage

---

**Can CO be detected?**

Yes, CO can be detected with CO detectors that meet the requirements of Underwriters Laboratories (UL) standard 2034.

Since the toxic effect of CO is dependent upon both CO concentration and length of exposure, long-term exposure to a low concentration can produce effects similar to short term exposure to a high concentration.

Detectors should measure both high CO concentrations over short periods of time and low CO concentrations over long periods of time - the effects of CO can be cumulative over time. The detectors also sound an alarm before the level of CO in a person's blood would become crippling. CO detectors that meet the UL 2034 standard currently cost between \$35 and \$80.

**Where should the detector be installed?**

CO gases distribute evenly and fairly quickly throughout the house; therefore, a CO detector should be installed on the wall or ceiling in sleeping area/s but outside individual bedrooms to alert occupants who are sleeping.

**Aren't there safety devices already on some appliances? And if so, why is a CO detector needed?**

Vent safety shutoff systems have been required on furnaces and vented heaters since the late 1980s. They protect against blocked or disconnected vents or chimneys. Oxygen depletion sensors (ODS) have also been installed on unvented gas space heaters since the 1980s. ODS protect against the production of CO caused by insufficient oxygen for proper combustion. These devices (ODS and vent safety shutoff systems) are not a substitute for regular professional servicing, and many older, potentially CO-producing appliances may not have such devices. Therefore, a CO detector is still important in any home as another line of defense.

**Are there other CO detectors that are less expensive?**

There are inexpensive cardboard or plastic detectors that change color and do not sound an alarm and have a limited useful life. They require the occupant to look at the device to determine if CO is present. CO concentrations can build up rapidly while occupants are asleep, and these devices would not sound an alarm to wake them.

**For additional information, write to the U.S. Consumer Product Safety Commission, Washington, D.C., 20207, call the toll-free hotline at 1-800-638-2772, or visit the website <http://www.cpsc.gov>**